Klamath National Forest
Best Management Practices

REGION 5
EVALUATION PROGRAM
WATER QUALITY
MONITORING REPORT
2004

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Evaluation of Forest Service administered projects including timber sales, roads, grazing, vegetation manipulation, prescribed fire, recreation sites, and mining activities

www.r5.fs.fed.us/klamath/projects/forestmanagement/index.shtml

Natural Resources Staff
1312 Fairlane Road
Yreka, CA 96097

KLAMATH NATIONAL FOREST
2004
BEST MANAGEMENT PRACTICES (BMP)

SUMMARY

Calendar year 2004 was the thirteenth year of the Best Management Practices Evaluation Program (BMPEP) on the Klamath National Forest and the Forest Service Pacific Southwest Region. This program is designed to evaluate how well the Forest and the Region implement BMPs and how effectively the BMPs control water pollution from National Forest lands. Onsite evaluations have been divided into 28 evaluation categories that reflect timber, engineering, recreation, grazing, fire, mining, and vegetative activities.

The Klamath Forest's BMPEP is composed of two sampling strategies. The first is the evaluation of randomly sampled sites, where data are collected and entered into a Regional database. The second strategy is concurrent monitoring, in which sites are selected based on management interest in specific ongoing projects. Concurrent evaluations are "real time" and can be qualitative. Most randomly sampled site evaluations require that 1 to 2 winters have passed prior to completing the field assessment. The results of these two program parts are summarized here separately.

Randomly sampled sites: In 2004, 54 sites on 18 projects were randomly drawn from Forest activity pools. Each project or site was reviewed for BMP implementation and effectiveness. Timber (11 sites), road (22 sites), recreation (3 sites), grazing (3 sites), common variety rock pits (2 sites), mining operations (1), vegetation manipulation (3), revegetation of disturbed areas (2), and fire (7 sites) activities were evaluated. Monitored activities were located on Happy Camp, Oak Knoll, Salmon River, Scott River, and Goosenest Districts.

BMP Implementation was evaluated to determine whether: (1) we did what we said we were going to do to protect water quality; and (2) project environmental documentation and/or contract/permit language was sufficient to protect water quality. BMP effectiveness determined if water quality protection measures met objectives. Sediment deposition volume (if any) and proximity to the nearest watercourse were used to indicate levels of water quality protection. The following table summarizes the results of the **BMP Random Site Evaluation Program for 1992 through 2004** on the Klamath National Forest. Sites that partially meet evaluation criteria are not tallied in the "fully successful" group.

Table 1. BMP Random Site Evaluation Program from 1992 through 2004 on the Klamath NF.

Monitoring Years	Total # of Sites Monitored	Sites Meeting BMP Evaluation Criteria			
		Implementation		Effectiveness	
		# of Sites	% of Sites Fully Successful	# of Sites	% of Sites Fully Successful
1992	53	29	55%	43	81%
1993	77	61	79%	72	94%
1994	52	39	75%	46	89%
1995	77	64	83%	74	96%
1996	57	48	84%	56	98%
1997	60	60	100%	59	98%
1998	61	38	62%	30/35	86%
1999	38	25	66%	34	89%
2000	45	40	89%	43	96%
2001	64	56	88%	61	95%
2002	53	49	92%	47	96%
2003	51	51	80%	45	90%
2004	**54**	**49**	**91%**	**53**	**98%**

In 2004, BMPs were fully implemented at 91% of the sites evaluated and effective at 98% of the sites evaluated (water quality was protected at some sites even if BMPs were not fully implemented). This represents an improvement in BMP implementation and effectiveness compared to 2003

Concurrent monitoring in 2004 focused on in-channel construction sites and snow removal (plowing).

BMP MONITORING REPORT

INTRODUCTION

On-site evaluations are the core of the BMP Evaluation Program. There are 30 different evaluation procedures designed to assess a specific practice or set of closely related practices. Though the evaluation criteria vary based on the management activity, the evaluation process is similar. The Regional Office annually assigns the type and number of management activities to be evaluated on each Forest. The specific sites for each evaluated management activity are randomly selected from Forest project pools. The criteria for sample pool development are Regionally standardized by activity type and described in the BMPEP User's Guide (2000 revision) (see Appendix A: BMP Evaluation Procedure Names and Descriptions). Some minor changes in the forms for E10 (road decommissioning) and G24 (grazing) resulted from field protocol testing on the Forest in 2002.

Concurrent BMP monitoring is accomplished while the project is actively operating. Projects are selected that are of management interest with regard to timely water quality protection implementation. Feedback is immediate and remedial action can be taken. A comprehensive assessment of BMP effectiveness is not possible since there has not been a post-project winter to test the protection measures.

BMP monitoring strives for interdisciplinary evaluation of projects, including project proponents and watershed personnel. This interdisciplinary effort provides direct feedback to the project proponent on how well the BMP was implemented and allows for adaptive management on future project design.

BMP evaluations were conducted by Juan de la Fuente, Polly Haessig, Sharon Koorda, Tom Laurent, Robbie Van de Water, Bill Snavely and assistance from District personnel.

RANDOMLY SAMPLED SITE PROGRAM

Data collection methods are specific for each BMP and are described in the 1999 BMP User's Guide. BMP evaluations that require monitoring soil cover use the Forest's soil cover monitoring procedures developed by the Forest in 1998. The data gathered are identified for each BMP and used to answer specific evaluation questions on each BMP evaluation form. Management activities (e.g. timber projects, roads, prescribed fire, tractor piling) require: 1) a prepared EA or EIS; 2) adherence to contract requirements; and 3) the passing of at last one winter (but not more that 3 winters) since contract requirements were met. In-channel construction is an exception because the evaluation (E-13) is done during the activity.

The timber, silviculture and engineering project sample pool was developed from a list of closed timber sales. The prescribed fire sample pool was developed from a list of completed prescribed fire projects.

The recreation sample pools included all known developed and dispersed recreation sites on the Forest. The grazing sample pool was a list of active grazing allotments on the Forest by district.

CONCURRENT MONITORING PROGRAM

Data collection was similar to that used for random sampled sites, however narrative reports may have been used in lieu of evaluation forms. The data may be more qualitative than that collected using the strict Regional protocol, although often the same forms are used. The primary difference from the randomly selected sites is that no significant runoff has occurred since project implementation.

SUMMARY BY PROJECT TYPE

Unless otherwise stated, the following results are from random sampled sites,

T01 Streamside Management Zones (SMZ)

Two harvest units (161, 162) were reviewed from the Glassups timber sale on the Salmon River District. The SMZ was 170 feet per side and was not flagged on the ground. The SMZ was a no cut riparian reserve. All of the reviewed SMZs met BMP implementation and effectiveness evaluation requirements.

T02 Skid Trails

Skid trails were evaluated in two units (192, 193) of the Glassups timber sale. The water bar failure was less than 10%. A few rills were present but did not travel beyond the water bar. In unit 192, reuse of existing skid trails included skid trails on slopes >35%. Slash was spread on these to minimize erosion. The skid trails met all evaluation criteria for BMP implementation and effectiveness.

T03 Suspended Yarding

Two harvest units (160, 165) were reviewed from the Glassups Timber Sale on the Salmon River District. The timber sale required one-end log suspension during yarding operations. Several yarding corridors were field inspected. No erosion was noted in the corridors. Retained soil cover was adequate to protect the soil. Suspended yarding operations met all evaluation criteria for BMP implementation and effectiveness.

T04 Landings

Four log landings were reviewed in four units (160, 161, 165, 193/199) on the Glassups TS. Two of the landings were skyline landings and two were helicopter landings. There was minimal evidence of erosion on the landings. One helicopter landing was rocked for winter use. The landings met all evaluation criteria for BMP implementation and effectiveness

T06 Special Erosion Control and Revegetation

One tractor yarded harvest unit (192) of the Glassups TS had the steeper (>35% slope) portions of skid trails mulched with harvest created slash. On-site evaluations indicated that slash spreading was very effective in minimizing surface erosion. Water bars were also installed prior to slash spreading. This special erosion control requirement met all evaluation criteria for BMP implementation and effectiveness requirements.

E08 Road Surface, Drainage and Slope Protection

One existing temporary road (39N27A) was reopened by the Glassups timber sale. Road maintenance was the evaluated work. No problems were observed on this road. The maintenance of this road improved the existing drainage and road surface condition. This special erosion control requirement met all evaluation criteria for BMP implementation and effectiveness requirements.

E09 Stream Crossing

One stream crossing was evaluated on road 39N54 in the Glassups timber sale. This was a rolling dip that drained flow from a spring across the road. The spring drained into an inboard ditch then a Type 2 dip drained the ditch flow across the road. The field review concluded that a Type 4 dip crossing should have been used. The dip should have been rocked and rock dissipaters used on the down side of the dip to protect the fill slope and road edge. This site did not meet BMP implementation requirements because the ID team did not develop design objectives for this site. This site did meet BMP effectiveness requirements.

E10 Road Decommissioning

Six sites from three road decommissioning projects on the Happy Camp and Salmon River Districts were evaluated. Two sites on the Jefferson ERFO project on Happy Camp District were evaluated. These two sites fully met BMP requirements. Two sites on the Music Road Decommissioning Project on the Salmon River District were evaluated. These two sites fully met BMP requirements. Two sites on the Summerville Decommissioning project on the Salmon River District were evaluated. These two sites fully met BMP requirements. All six sites met BMP implementation and effectiveness criteria.

E11 Control of Sidecast Material

Spur road 39N27A in the Glassups timber sale was evaluated. This BMP evaluated sidecasting on reconstruction of an existing road. Field evaluation observed a few areas of inadvertent sidecasting. Overall, this BMP evaluation met all the implementation and effectiveness criteria.

E12 Servicing and Refueling

One helicopter servicing and fueling site in the Glassups timber sale on the Salmon River District was evaluated. This site, containing helicopter fuel (Jet A) as well as diesel fuel for equipment, was located within the Jessups Creek watershed. The site was approximately 200 feet from Jessups Creek. This BMP evaluation met all the implementation and effectiveness requirements.

E13 In-Channel Construction Practices

Three in-channel construction sites on two road reconstruction projects (one on Salmon River RD and one on Oak Knoll RD) were evaluated. The project evaluated on the Salmon River RD was the Lower South Fork Decommissioning Phase 2 project. One site on road 39N30B was evaluated. This site did not meet the implementation requirements because some areas of disturbed channel were not returned to the natural grade, alignment and condition. This site did meet the effectiveness requirements. Two sites in the Grider Creek Restoration Project were evaluated on roads 45N78A and 46N66. The site on road 45N78A did not meet the implementation requirements because the excavated material was not moved to an area safe from high water. Overall, only one of three sites met the BMP implementation requirements, however, all three sites met the BMP effectiveness requirements.

E14 Temporary Roads

Two temporary roads that accessed units165 and 192 within the Glassups timber sale were evaluated. No streams were crossed by these roads. The road accessing unit 165 was described in the field as an excellent example of temporary road obliteration by recontouring. The temporary road accessing unit 192 was waterbarred at 80 foot spacings and met decommissioning specifications. Both of these temporary roads met the BMP implementation and effectiveness requirements.

E16 Water Source Development

Two existing water drafting sources used by the Glassups timber sale were evaluated. One site was located on county road 1C01 and Forest road 39N27. Both of these sites met BMP implementation and effectiveness requirements.

E17 Snow Removal

Snow removal activities on roads in the Deer Mountain timber sale and Bear Peak silviculture project were evaluated. Within the Deer Mountain timber sale project (Goosenest District), road 43N69 was inspected. It met all the BMP requirements. Within the Bear Peak project (Happy Camp District), roads 15N19 and 15N30 were evaluated. These two roads met all the BMP requirements. All three sections of the evaluated Forest roads met BMP implementation and effectiveness requirements.

E19 Restoration of Borrow Pits and Quarries

Two borrow pits were evaluated. One was on the Ukonom District and was used for the Siskon Mine rehabilitation project. During implementation there was a modification of the original contract specifications. Rock material was placed at the bottom of the reshaped burrow source as an additional erosion control measure. This work met the BMP requirements. A borrow source area within the Glassups timber sale area was evaluated on the Salmon River District. This rock source met all the BMP requirements. Both of these borrow pits met all BMP implementation and effectiveness requirements.

R22 Developed Recreation Sites

One developed recreation site, Idlewild Campground on the Salmon River District was evaluated. This campground met all the BMP implementation and effectiveness requirements.

R30 Dispersed Recreation Sites

Two dispersed recreation sites were evaluated. A popular site on the lower reach of Antelope Creek on the Goosenest District was selected. This site failed BMP implementation due to poor SMZ protection and lack of barricades and signing. The Coon Creek river access on the Klamath River on the Happy Camp District was also evaluated. This site fully met all BMP requirements. Overall, BMP implementation was met on one evaluated site and implementation criteria were fully met on both sites.

M26 Mining Operations

One mining operation, Nancy Placer, on Knownothing Creek on the South Fork Salmon River, Salmon River District was evaluated. There are two open pit excavations that are currently being worked. BMP implementation did not pass due to no protective measures for hazardous materials at the house and from leaking equipment. This site met all the effectiveness criteria because there was no evidence of transport of materials to the SMZ and what refuse or waste that was in the SMZ had a low risk of transport to the channel.

M27 Common Variety Minerals

Two rock pits associated with road projects on Salmon River RD were evaluated. One site was the Lafayette rock pit on road 39N23 and the other site was on road 38N17 in Matthews Creek. Both sites met all BMP implementation requirements and BMP effectiveness criteria.

G24 Range Management

The 2001 BMPEP Handbook draft procedure was used to evaluate Seiad-Jonny allotment (Seiad Creek pasture/management unit) on Happy Camp District and Eagle Creek (Upper Eagle Creek pasture/management unit) and Boulder Creek (Little Elk pasture/management unit) allotments on the Scott River District. The Little Elk pasture/management unit did not meet effectiveness requirement probably due to bank stability falling within the 70-80% range and less than 10% of the lentic habitat was disturbed. The new evaluation protocol requires measuring specific stream bank disturbance and woody plant utilization against Forest or Annual Operating Plan (AOP) objectives. The specific objectives do not exist on the Klamath NF AOPs. (See Adaptive Management Discussion, section 3 - Practices for Possible Modification). All sampled sites met implementation criteria but only two met all the effectiveness requirements.

F25 Prescribed Fire

Seven prescribed burn units were monitored across the Forest. Three units in the Upper South Fork timber sale (#96, 102, 111) and one unit in the Glassups timber sale (#189) on the Salmon River District were evaluated. Soil cover objectives ranged from 50-80% depending on slope steepness. Post-burning ground cover objectives were exceeded in all four units. The retained soil cover averaged 83 to 87% in these units. Two units on the Happy Camp District were evaluated. The Shinar underburn required 70% cover retention. The post-burning soil cover averaged 90% for the unit. The Luther underburn required 50-60% cover retention. The post-burning soil cover averaged 95%. The Blue Jay underburn on the Scott River District was evaluated. This underburn required 50-70% soil cover depending on slope steepness. Post-burning soil cover averaged 93%. These seven burn units met all BMP requirements for implementation and effectiveness.

V28 Vegetation Manipulation

Two mastication units (Lower Pollucks Gulch and Upper Indian Creek) on the Salmon River District were evaluated. The ground cover objective for both units was 70%. Measured soil cover was 99% and 96%, respectively. One tractor pile unit from the Glassups timber sale was evaluated. The ground cover objective was 70%. Measured soil cover was 85%. All three units met all implementation requirements and effectiveness criteria.

V29 Revegetation of Surface Disturbed Areas

Two road decommissioning sites in the Upper South Fork timber sale on the Salmon River District were evaluated. Contract specifications for road 37N65 called for 3000# straw/acre. The literature indicates that this equates to 70-80% soil cover. Measured soil cover was 85%. Temporary road T-15 was decommissioned. This included ripping, seeding and placing straw on the road. The contract required

3000# straw/acre. Measured soil cover was 93%. These two sites met all implementation requirements and effectiveness criteria.

RESULTS SUMMARY

Timber, fire, and vegetation management evaluated sites met all BMP implementation and effectiveness requirements at the 100% level. Engineering, recreation, range, and minerals evaluated sites did not meet either BMP implementation or effectiveness requirements in every instance, as previously noted in the "Summary by Project Type" discussions.

Overall, 91% of the evaluated sites met all BMP implementation requirements and 98% of the sites met all BMP effectiveness requirements. This is an increase in BMP implementation and effectiveness compared to the 2003 results. The few problem areas were associated with stream crossings, in-channel construction activities, dispersed recreation sites, mining operations and grazing. There was no evidence of water quality impairment from noncompliant sites.

Summary of 2004 BMP Implementation and Effectiveness Success Rate by Individual BMPs.
(Randomly sampled sites)

BMP	Total # of Sites	IMPLEMENTATION		EFFECTIVENESS	
		# of Sites Meeting BMP Criteria	% of Total	# of Sites Meeting BMP Criteria	% of Total
T01	2	2	100	2	100
T02	2	2	100	2	100
T03	2	2	100	2	100
T04	4	4	100	4	100
T06	1	1	100	1	100
Timber subtotal	*11*	*11*	*100*	*11*	*100*
E08	1	1	100	1	100
E09	1	0	0	1	100
E10	6	6	100	6	100
E11	1	1	100	1	100
E12	1	1	100	1	100
E13	3	1	33	3	100
E14	2	2	100	2	100
E16	2	2	100	2	100
E17	3	3	100	3	100
E19	2	2	100	2	100
Engineering Subtotal	*22*	*19*	*86*	*22*	*100*
R22	1	1	100	1	100
R30	2	1	50	2	100
Recreation Subtotal	*3*	*2*	*67*	*3*	*100*
G24	3	3	100	2	67
Range Subtotal	*3*	*3*	*100*	*2*	*67*
F25	7	7	100	7	100
Fire Subtotal	*7*	*7*	*100*	*7*	*100*
M26	1	0	0	1	100
M27	2	2	100	2	100
Minerals Subtotal	*3*	*2*	*67*	*3*	*100*
V28	3	3	100	3	100
V29	2	2	100	2	100
Vegetation Subtotal	*5*	*5*	*100*	*5*	*100*
TOTALS	**54**	**49**	**--**	**53**	**--**
% Successful		**91%**		**98%**	

CONCLUSIONS

Implementation standards for BMPs were fully compliant on 91% of the sites evaluated. BMP effectiveness requirements were met on 98% of the sites evaluated. This represents an improvement in BMP implementation and effectiveness from 2003. Further improvement in BMP implementation is needed in: stream crossings (evaluation E09), in-channel road/bridge construction practices (evaluation E13), dispersed recreation sites (evaluation R30), mining operations (evaluation M26) and grazing (evaluation G24).

Appendix A.

BMP Evaluation Procedure Names and Descriptions.

Procedure #	*Procedure Name (BMPs Monitored)*
T01	Streamside Management Zones* (BMP 1.8, 1.19, 1.22)
T02	Skid trails (BMP 1.10, 1.17)
T03	Suspended yarding (BMP 1.11)
T04	Landings (BMP 1.12, 1.16)
T05	Timber sale administration (BMP 1.13, 1.20, 1.25)
T06	Special erosion control and revegetation (BMP 1.14, 1.15)
T07	Meadow protection (BMP 1.18, 1.22, 5.3)
E08	Road surface, drainage and slope protection (BMP 2.2, 4, 5, 10, 23)
E09	Stream crossings (BMP 2.1)
E10	Road Decommissioning (BMP 2.26)
E11	Control of side cast material (BMP 2.11)
E12	Servicing and refueling (BMP 2.12)
E13	In-channel construction practices (BMP 2.14, 2.15, 2.17)
E14	Temporary roads (BMP 2.16, 2.26)
E15	Rip rap composition (BMP 2.20)
E16	Water source development (BMP 2.21)
E17	Snow removal (BMP 2.25)
E18	Pioneer road construction (BMP 2.3, 2.8, 2.9, 2.19)
E19	Restoration of borrow pits and quarries (BMP 2.27, 2.18)
E20	Management of roads during wet periods (BMP 2.24, 7.7)
R22	Developed recreation sites (BMP 4.3, 4, 5, 6, 9, 10)
R23	Location of stock facilities in wilderness (BMP 4.11)
G24	Range management (BMP 8.1, 8.2, 8.3)
F25	Prescribed fire (BMP 6.3)
M26	Mining operations (Locatable minerals) (BMP 3.1, 3.2)
M27	Common variety minerals (BMP 3.3)
V28	Vegetation manipulation (BMP 5.1, 5.2, 5.5, 5.7)
V29	Revegetation of surface disturbed areas (BMP 5.4)
R30	Dispersed Recreation Sites (BMP 4.5, 4.6, 4.10)